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Notes:

1. Untranslatable words are replaced with asterisks (****).
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CLAIM + DETAILED DESCRIPTION

[Claim(s)]

[Claim 1] After heating the scrap wood of the plaster board of the gypsum-fibrosus heart to which the stencil paper for plaster board adheres in part at least, How to collect the stencil paper for plaster board, and gypsum fibrosus from the scrap wood of the plaster board characterized by collecting the stencil paper for plaster board which gave water, was made to separate the stencil paper for plaster board from the gypsum-fibrosus heart, and was this separated, and the gypsum fibrosus which constitutes the gypsum-fibrosus heart, respectively.

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the method of collecting the stencil paper for plaster board, and gypsum fibrosus from the scrap wood of the plaster board which was suitable as the treatment method of the scrap wood of plaster board.

[0002]

[Description of the Prior Art] Plaster board has fire-resistive nature, insulation, etc., and since it is economical, it is used abundantly as structural materials in recent years. Such plaster board has tabular structure which covered with the stencil paper for plaster board the core material which makes gypsum fibrosus a subject, and it is constituted from plaster board with a product thickness of 12mm by the rate of 93 weight % (it is hereafter called % for short.) of gypsum-fibrosus ****, and about 7% of an original pile of paper. This plaster board is used everywhere in the building, and the remaining end material and the massive or powdered waste (henceforth scrap wood) which were cut according to the size of a use part are generated at the construction spot. If the yield of the scrap wood is said a little more than about 10% of the amount used and it considers that the annual usage of plaster board is about 5 million t, the scrap wood of around about 500,000t plaster board is generated as industrial waste, and is disposed of by reclamation etc. like other industrial waste. On the other hand, the disposal by the reclamation of industrial waste etc. becomes an issue socially from the thing of an

environment top and others, and in our country poor in resources, "Law for the Promotion of Utilization of Recycled Resources (recycling law)" is proclaimed in Heisei 3(1991) April, and is enforced in October of the same year. Moreover, some other industrial waste is under the regulation system already fundamentally considered as a manufacturer burden, and development of the method of processing effectively recyclable industrial waste is furthered. It is anxious for development of the treatment method which the scrap wood of the plaster board produced from the construction spot etc. does not leak to an example, either, does not dispose of this scrap wood as industrial waste under such a situation, and can be used effectively.

[0003]

[Problem(s) to be Solved by the Invention] This invention aims at offering the treatment method which can reuse effectively the scrap wood of the plaster board generated in the construction spot and others.

[0004]

[Means for Solving the Problem] If water is given after this invention heats the scrap wood of plaster board, it can be completely divided into the stencil paper for plaster board which constitutes plaster board, and gypsum fibrosum which is the principal component of a core material, and what was collected is made based on knowledge that it is recyclable as a waste paper or a gypsum-fibrosum raw material, respectively. Namely, after this invention heats the scrap wood of the plaster board of the gypsum-fibrosum heart to which plaster board stencil paper adheres in part at least, Water is given and the method of collecting the stencil paper for plaster board and gypsum fibrosum from the scrap wood of the plaster board characterized by collecting the stencil paper for plaster board which was made separating the stencil paper for plaster board, and was this separated from the gypsum-fibrosum heart, and the gypsum fibrosum which constitutes the gypsum-fibrosum heart, respectively is offered. generally the plaster board used as the object which gives the method of this invention is in the form which covered the surroundings of the gypsum-fibrosum heart with the stencil paper for plaster board (henceforth stencil paper) -- the form of the scrap wood -- tabular -- it is massive or powdered. In particular, tabular and when massive, in order to make it the size which can be heated uniformly, a crushing process can be established before a heating step. The degree of crushing at that time should just be the grain size which gypsum fibrosum may continue being in adhesion or the state stuck in part, and the gypsum-fibrosum heart can heat uniformly to an adhesion side with the gypsum-fibrosum heart of stencil paper. It is 10mm or less preferably. Under the present circumstances, if can sift a crushing article, the gypsum-fibrosum (gypsum dihydrate) powder which passed the sieve can be used as a gypsum-fibrosum raw material, only the stencil paper to which the gypsum fibrosum which remained on the sieve adhered can be sent to the heating step of this invention etc. and such a process is adopted The treatment efficiency of the scrap wood of plaster board can be raised sharply. The scrap wood of plaster board may be heated directly, using a rotary kiln etc. as the heating method in the heating step of this invention, and you may be the method of carrying out indirect heating using **** etc. Moreover, the range of 100-200 degrees C is illustrated that what is necessary is just the temperature as for which gypsum fibrosum (gypsum dihydrate) is

made to the form (exsiccated gypsum) which contains some soluble anhydrous gypsum in hemihydrate gypsum or hemihydrate gypsum as cooking temperature. The desirable temperature range is 130-190 degrees C. In the above-mentioned temperature range, it is usually good to heat preferably for 1 to 2 hours for 0.5 to 3 hours.

[0005] Water is given to the scrap wood of the plaster board subsequently heated, and plaster board stencil paper is made to separate into it from the gypsum-fibrosum heart in this invention. Here, it can carry out by the method of putting in and immersing the scrap wood (you being after cooling) of the plaster board heated in the tank as giving water, the method of pouring water on the heated plaster board, etc. That is, water should just be given to the adhesion side of stencil paper and the gypsum-fibrosum heart. Thus, if water is given to the heated plaster board, of itself, exsiccated gypsum will be isolated from stencil paper and stencil paper and gypsum fibrosum will be separated completely. When the scrap wood of the plaster board heated in the tank is immersed, it may be momentary, but it is good to be preferably immersed for 1 to 2 minutes. Moreover, in the case of the method of pouring water on the scrap wood of the heated plaster board, it is good to pour water on the side to which exsiccated gypsum of stencil paper adheres, but it is not necessary to adhere to this. In addition, the scrap wood of the heated plaster board before giving water can be crushed so that exsiccated gypsum can be easily separated from the adhesion side of this stencil paper. It is good to crush in size of 10mm or less preferably. The crushing method of the above-mentioned description is not based on compression, an impact, shearing, usual friction, and usual cutting, and is not especially easy to be limited. Then, before giving water, a crushing article is sifted, the exsiccated gypsum powder which passed the sieve is collected, and if water is given only to the stencil paper to which the exsiccated gypsum which remained on the sieve adhered, the quantity of the gypsum slurry to generate can be reduced sharply. That is, before giving water, a partition process can be established and it can remove with exsiccated gypsum. If the separation method at that time is dry type, anything, it will be good, for example, a vibration screen and trommel will be mentioned. The collected exsiccated gypsum can be used as raw materials, such as plaster board.

[0006] In this invention, since it rises to surface for example, on the water surface in the case of the method of immersing in a tank, flotation is mentioned to the method of collecting these, but the stencil paper for plaster board separated by giving water to the scrap wood of the heated plaster board is not limited to this. And the stencil paper to collect can be used as the stencil paper for plaster board, or other raw materials as a waste paper. On the other hand, gypsum fibrosum can precipitate at the bottom of a tank and can be easily collected as gypsum slurry, for example, gypsum slurry of 1 to 10% of concentration. Moreover, this gypsum slurry can be dehydrated according to centrifugal separation, and subsequently it can dry, and can be again used as a raw material of the gypsum-fibrosum core material for plaster board.

[0007]

[Effect of the Invention] According to this invention, the scrap wood of the plaster board generated in the construction spot and others is completely separable into the effectively recyclable stencil paper for plaster board and gypsum fibrosum. Thus, each of the obtained stencil paper for plaster board and

gypsum fibrosum is usable as raw material of products the ability not only to re-use it as a waste paper as a raw material of the core material of the stencil paper for plaster board, or plaster board but various, and the use can use effectively the scrap wood of a lot of large plaster board. Next, this invention is explained using a work example.

[0008]

[Example]

It is a crusher about the scrap wood (the end material of 12-mm-thick plaster board and stencil paper are about 7% of the whole) of work-example 1 plaster board. It crushed, the crushing article of the plaster board which passed the 9th mm screen was obtained, and hemihydrate gypsum (exsiccated gypsum) was made to transpose gypsum dihydrate for 10kg (700g of **** of stencil paper) of this crushing article with indirect-with agitator heat transmission ***** heating apparatus. The heat time at this time was 165 degrees C in glow raising temperature in 90 minutes. When the gypsum-fibrosum portion of this heating article was checked by X-ray diffraction, there were not gypsum dihydrate and II type anhydrous gypsum, and it was hemihydrate gypsum (exsiccated gypsum) altogether. The above-mentioned heating article was crushed for 10 minutes with the ball mill containing 40kg of 25mmphi iron balls (capacity 24 l and number of rotations of 60rpm). All massive or granular gypsum fibrosum became powder by this crushing, and stencil paper became an about 4-8mm piece of paper, and was intermingled in this exsiccated gypsum. Subsequently, most stencil paper portions (piece of paper) were recoverable to the plus sieve by brandishing and dividing the above-mentioned heating crushing article in the mm [2nd] vibration screen. However, exsiccated gypsum had adhered to the collected piece of paper. On the other hand, since most was exsiccated gypsum powder, the minus sieve article was what can be used as exsiccated gypsum for plaster board as it is. Next, it is the whole quantity (1.31kg) of the piece of paper to which the above-mentioned exsiccated gypsum has adhered 20 lt supplied to underwater [of the liter], and after agitating lightly, it collected to the plus sieve. By repeating this operation 3 times, the piece of paper to which it can wash completely and gypsum fibrosum does not adhere was obtained, and exsiccated gypsum adhering to a piece of paper was able to obtain the piece of paper which can be used as a waste paper. The dry weight of this recovery piece of paper is 693g. It was. That is, the great portion of stencil paper in the scrap wood of plaster board is able to be collected. Using a centrifugal separator, most moisture is removed, it dries, and gypsum fibrosum in the penetrant remover of a minus sieve generated by supplying to the above-mentioned tank is 711g. Gypsum dihydrate was obtained. This gypsum dihydrate was recyclable as a raw material for plaster board.

[Translation done.]